

WHAT IS CLAIMED IS:

1. A method for attenuating an optical beam, said method comprising:
 - generating a communication beam at an optical input fiber;
 - generating an alignment beam at a beam generating element, wherein said alignment beam is associated with said communication beam;
 - receiving said alignment beam on a sensor, wherein said sensor provides a location of said alignment beam on said sensor; and
 - positioning said communication beam so that a desired percentage of said communication beam enters an output fiber, wherein said positioning of said communication beam comprises an offset from said location of said alignment beam.
2. The method according to claim 1, wherein said positioning is performed by a method comprising:
 - directing said communication beam to a micro electromechanical (MEMS) device; and
 - positioning said MEMS device so that said desired percentage of said communication beam enters said output fiber.
3. The method according to claim 1, wherein said positioning is performed

2 by a method comprising:

directing said communication beam to a first micro electromechanical
4 (MEMS) device;

positioning said first MEMS device so that said communication beam is
6 reflected from a surface of said first MEMS device and is redirected to a second
MEMS device; and

8 positioning said second MEMS device so that said desired percentage of
said communication beam enters said output fiber.

4. The method according to claim 1, said method further comprising:

repeatedly receiving said alignment beam to provide updated locations of
said alignment beam; and

repositioning said communication beam as necessary to reflect any
change in location of said alignment beam to maintain the desired percentage
6 of said communication beam that enters said output fiber.

5. The method according to claim 1, said method further comprising:

repeatedly determining said desired percentage of said communication
2 beam that enters said output fiber to determine if said desired percentage has
4 changed; and

repositioning said communication beam as necessary to reflect any
change in said desired percentage of said communication beam that enters said
output fiber.

6. The method according to claim 1, said method further comprising:
positioning said communication beam at about a center of a core in said
output fiber so that about all of said communication beam enters said output
fiber.

7. The method according to claim 1, said method further comprising:
positioning said communication beam at an offset from a center of a core
in said output fiber so only a portion of said communication beam enters said
output fiber.

8. The method according to claim 7, wherein each of a plurality of locations
on said sensor corresponds to a particular offset that said communication beam
enters said output fiber.

9. The method according to claim 1, wherein said communication beam and
said alignment beam are generated at a beam generation element, and wherein

4 said communication beam and said alignment beam proceed along paths that
are substantially parallel.

2 10. The method according to claim 1, wherein said communication beam and
said alignment beam are generated at a beam generation element, and wherein
4 said communication beam and said alignment beam proceed along paths that
are parallel.

2 11. The method according to claim 1, wherein said communication beam and
said alignment beam are generated at a beam generation element, and wherein
4 said communication beam and said alignment beam proceed along paths that
are converging.

2 12. The method according to claim 11, wherein said alignment beam and
said communication beam cross approximately midway along an optical path.

2 13. The method according to claim 1, wherein said communication beam and
said alignment beam are generated at a beam generation element, and wherein
4 said communication beam and said alignment beam proceed along paths that
are coaxial.

2 14. The method according to claim 1, wherein said sensor comprises a sensor selected from the group selected from a position sensitive diode (PSD), a charge coupled device (CCD), and a light sensitive CMOS sensor.

2 15. The method according to claim 1, wherein said sensor comprises a position sensitive diode (PSD).

2 16. The method according to claim 1, wherein said sensor comprises a charge coupled device (CCD).

2 17. The method according to claim 1, wherein said sensor comprises a light sensitive CMOS sensor.

2 18. The method according to claim 1, wherein said alignment beam is generated by a light source selected from the group consisting of a light emitting diode (LED), an optical fiber, a laser, and a vertical cavity surface emitting laser (VCSEL).
4

19. The method according to claim 1, wherein said alignment beam

2 comprises a light emitting diode (LED), said method further comprising:
providing a LED mask at said beam generating element to control an
4 amount of light produced by said LED.

20. The method according to claim 1, said method further comprising:
2 providing a first lenslet at said beam generating element, wherein said
lenslet collimates said alignment beam.

21. The method according to claim 20, said method further comprising:
2 providing a second lenslet at a beam receiving element, wherein said
second lenslet focuses said alignment beam onto said sensor.

22. The method according to claim 1, said method further comprising:
2 providing a lenslet at said beam generating element, wherein said lenslet
collimates said communication beam.

23. The method according to claim 22, said method further comprising:
2 providing a second lenslet at a beam receiving element, wherein said
second lenslet focuses said communication beam.

24. The method according to claim 1, wherein said alignment beam is generated by a light supplying fiber that is positioned in a fixed spatial relationship with said optical input fiber.

25. A method for attenuating a plurality of optical beams, said method comprising:

generating a plurality of communication beams at an optical input fiber;

generating a plurality of alignment beams at a beam generating element, wherein each of said plurality of alignment beams is associated with one of said plurality of communication beams;

receiving each of said plurality of alignment beams at a respective sensor, wherein each of said plurality of sensors provides a location of a received alignment beam on said respective sensor;

positioning each of said plurality of communication beams so that a desired percentage of each of said plurality of communication beams enters an associated output fiber; and

wherein said positioning of each of said plurality of communication beams comprises an offset from an associated one of said plurality of locations of said alignment beams.

26. The method according to claim 25, wherein said positioning of each of
said plurality of communication beams is performed by a method comprising:
directing each of said plurality of communication beams to a micro
electromechanical (MEMS) device; and
positioning said MEMS device so that said desired percentage of each of
said plurality of communication beams enters said associated output fiber.

27. The method according to claim 25, said method further comprising:
repeatedly receiving each of said plurality of alignment beams to provide
updated locations of each of said plurality of alignment beams; and
repositioning each of said plurality of communication beams as necessary
to reflect any change in location of each of said plurality of alignment beams to
maintain the desired percentage of each of said plurality of communication
beams that enter said associated output fiber.

28. The method according to claim 25, said method further comprising:
repeatedly determining said desired percentage of each of said plurality
of communication beams that enter said associated output fiber to determine
if said desired percentage has changed; and
repositioning each of said plurality of communication beams as necessary

6 to reflect any change in said desired percentage.

29. The method according to claim 25, said method further comprising:

2 positioning at least one of said plurality of communication beams at about
a center of a core in said output fiber so that about all of said at least one of
4 said plurality of communication beams enter said output fiber.

30. The method according to claim 25, said method further comprising:

2 positioning at least one of said plurality of communication beams at an
offset from a center of a core in said output fiber so that only a portion of said
4 at least one of said plurality of communication beams enters said output fiber.

31. The method according to claim 25, wherein each of said plurality of
2 communication beams and each of said plurality of alignment beams are
generated at a beam generation element; and

4 wherein each of said plurality of communication beams and each of said
plurality of alignment beams proceed along paths that are substantially parallel.

32. The method according to claim 25, wherein each of said plurality of
2 communication beams and each of said plurality of alignment beams are

generated at a beam generation element; and

wherein each of said plurality of communication beams and each of said plurality of alignment beams proceed along paths that are parallel.

33. The method according to claim 25, wherein each of said plurality of communication beams and each of said plurality of alignment beams are generated at a beam generation element; and

wherein each of said plurality of communication beams and each of said plurality of alignment beams proceed along paths that converge.

34. A method for providing optical beam attenuation using a single reflecting device, said method comprising:

providing a beam generating element comprising an optical input fiber and a first lenslet;

providing a beam receiving element comprising an optical output fiber and a second lenslet;

generating a communication beam at said optical input fiber;

collimating said communication beam at said first lenslet;

directing said collimated communication beam to a micro electromechanical (MEMS) device;

positioning said MEMS device so that said collimated communication beam is reflected and passes through said second lenslet to produce a focused communication beam;

wherein said MEMS device is positioned so that a desired percentage of said focused communication beam enters said output fiber; and

wherein said positioning of said MEMS device is based on known relative locations of said input fiber and said output fiber.

35. The method according to claim 34, said method further comprising:

repositioning said micro electromechanical (MEMS) device as necessary to maintain the desired percentage of said communication beam that enters said output fiber.

36. A method for providing optical beam attenuation using multiple reflecting devices, said method comprising:

providing a beam generating element comprising an optical input fiber and a first lenslet;

providing a beam receiving element comprising an optical output fiber and a second lenslet;

generating a communication beam at said optical input fiber;

8 collimating said communication beam at said first lenslet;

10 directing said collimated communication beam to a first micro
electromechanical (MEMS) device, where said collimated communication beam
is redirected to a second MEMS device;

12 positioning said second MEMS device so that said collimated
communication beam is reflected and passes through said second lenslet to
14 produce a focused communication beam;

16 wherein said second MEMS device is positioned so that a percentage of
said focused communication beam enters said output fiber; and

18 wherein said positioning of said second MEMS device is based on known
relative locations of said input fiber and said output fiber.

37. The method according to claim 36, said method further comprising:

2 repositioning said second micro electromechanical (MEMS) device as
necessary to maintain the desired percentage of said communication beam that
4 enters said output fiber.